

# Python Summary 4: Loops 1: For loops

## Loops:

Loops allow us to repeat an action some number of times. In Python, there are two main types of loops that are used: for loops and while loops.

*for* loops iterate over (go through each item in turn) a list, and stop when they reach the end of the list. *while* loops contain a condition, and repeat until the condition is False.

## For loops:

At this stage, we'll just look at for loops that use the `range()` function. Here is an example:

```
#print the numbers 1 to 10
for num in range(1, 11):
    print(num)
```

`range()` can take one, two or three values. If you give it one value, it will count from 0 to that value - 1. For example, `range(5)` will give you the numbers {0, 1, 2, 3, 4} in turn.

If you give range two values, it will count from the first value to one less than the second value. For example, `range(1, 6)` gives the numbers 1, 2, 3, 4, 5.

In a for loop, the variable you name in the first line (num in the example above), is set to each value in turn. The following code will print 5 lines, each with one more 'a' than the last:

```
for num in range(1, 6):
    print("a" * num)
```

As with if statements, any code inside the for loop must be indented by 4 spaces. Try the previous examples out in IDLE.

## Test Yourself:

Write some code to accomplish the following task in order:

1. Print each number from 0 to 100
2. Print the first 5 square numbers
3. Print a triangle that looks like:

```
*
**
***
****
*****
*****
```

4. Ask the user for a number, and print a square of '#' symbols that size. i.e. If n is the number given by the user, it should have n lines with n '#' symbols in each line
5. Print the first 20 multiples of 5